Claims

1. (currently amended) A plastid transformation vector for stably transforming a target plastid genome, comprising, as operably-linked components, a first flanking sequence, a DNA sequence coding for a IFNα2b or a polypeptide having at least 95 percent sequence identity therewith, which is capable of expression in a plastid, and a second flanking sequence, wherein said IFNα2b or polypeptide is competent to produce an immunogenic response in a mammal, and wherein said first and second flanking sequences comprise a sequence inclusive a transcriptionally active spacer sequence of the target plastid genome, whereby stable integration of the DNA sequence into the target plastid genome is facilitated through homologous recombination of the first and second flanking sequences with substantially homologous sequences in the target plastid genome.

2. (previously presented) The vector of claim 1, wherein said IFNα2b or polypeptide further comprises a polyhistidine purification tag and a thrombin cleavage site.

3. (previously presented) The vector of claim 1 further comprising a regulatory sequence.

4. (previously presented) The vector of claim 3, wherein said regulatory sequence comprises a promoter operative in a plastid genome.

5. (original) The vector of claim 4, wherein said promoter is 16srRNA.

6. (previously presented) The vector of claim 3, wherein said regulatory sequence comprises light regulated psbA 5' and psbA 3' elements.

7. (cancelled).

8. (cancelled).

9. (cancelled).

10. (cancelled)

11. (cancelled).

12. (cancelled)

13. (previously presented) The vector of claim 3, wherein said regulatory sequence further comprises a 5' untranslated region (5'UTR) capable of providing transcription and translation enhancement of said DNA sequence coding for IFNα2b or said polypeptide.

14. (previously presented) The vector of claim 3, wherein said regulatory sequence further comprises a 3' untranslated region (3'UTR) capable of conferring transcript stability to said IFNα2b or said polypeptide.

15. (original) The vector of claim 1, wherein said first flanking sequence is trnI, and wherein said second flanking sequence is trnA.

16. (previously presented) The vector of claim 15, wherein trnI and trnA provide for homologous recombination to insert said DNA sequence into the spacer region in an inverted repeat region of a chloroplast genome.

17. (previously presented) The vector of claim 1, wherein said vector inserts said DNA sequence coding for IFNα2b or said polypeptide into a single copy region of a plastid genome.

18. (original) The vector of claim 13, wherein said 5' UTR is a 5'UTR of psbA.

19. (original) The vector of claim 14, wherein said 3'UTR is a 3'UTR of psbA.

20. (original) The vector of claim 1, further comprising a DNA sequence encoding a selectable marker.

21. (original) The vector of claim 20, wherein said selectable marker is an antibiotic-free selectable marker.

22. (original) The vector of claim 21, wherein said antibiotic-free selectable marker is Betaine aldehyde dehydrogenase (BADH).

23. (original) The vector of claim 20, wherein said DNA sequence encoding a selectable marker encodes an antibiotic resistant selectable marker.

24. (original) The vector of claim 23, wherein said antibiotic resistant selectable marker is aadA.

25. (previously presented) A method for producing IFNα2b or a polypeptide having at least 99 percent sequence identity therewith, said method comprising: integrating the plastid transformation vector of claim 1 into the plastid genome of a plant cell; and growing said plant cell to thereby express said IFNα2b, wherein said IFNα2b or polypeptide is competent to produce an immunogenic response in a mammal.

26. (cancelled).

27. (cancelled)

28. (cancelled).

29. (cancelled).

30. (cancelled)

31. (cancelled).

32. (cancelled).

33. (previously presented) A method for variable-expressing IFNα2b or a polypeptide having at least 99 percent sequence identity therewith comprising: transforming a plastid genome of a plant cell with a transformation vector according to claim 1; and regenerating said plant cell into a plant that expresses said IFNα2b or polypeptide.

34. (previously presented) The method of claim 33, further comprising: extracting said IFNα2b or said polypeptide from leaves of said plant and isolating IFNα2b or said polypeptide from other plant proteins.

35. (previously presented) A plant stably transformed with the transformation vector of claim 1, so as to express IFNα2b or a polypeptide having at least 95 percent sequence identity therewith, wherein the IFNα2b or the polypeptide is competent to induce an immunogenic response in a mammal.

36. (original) A progeny of the plant of claim 35.

37. (original) A seed of the plant of claim 35.

38. (previously presented) A part of the plant of claim 35, comprising a plastid including said DNA sequence coding said IFNα2b or said polypeptide.

39. (original) The plant of claim 35, wherein said plant is an edible plant suitable for mammal consumption.

40. (original) The plant of claim 39, wherein said edible plant is LAMD-609.

41. (previously presented) The plant of claim 35, wherein said plant further comprises at least one chloroplast transformed with said vector.

42. (previously presented) The plant of claim 35, wherein said plant further comprises mature leaves transformed with said vector.

43. (previously presented) The plant of claim 35, wherein said plant further comprises young leaves transformed with said vector.

44. (previously presented) The plant of claim 35, wherein said plant further comprises old leaves transformed with said vector.

45. (previously presented) The plant of claim 40, wherein the expression of IFNα2b or said polypeptide is at least about 6.0 percent total soluble protein.

46. (previously presented) The plant of claim 40, wherein said expression of IFNα2b or said polypeptide in said edible plant is about 12.5 percent total soluble protein.

47. (original) The plant of claim 35, wherein said plant is *Nicotiana tabacum* cv. Petit

Havana.

48. (previously presented) The plant of claim 47, wherein the expression of IFNα2b or said polypeptide in said Nicotiana tabacum cv. Petit Havana is at least 4.0 percent total soluble protein.

49. (previously presented) The plant of claim 47, wherein the expression of IFNα2b or said polypeptide in said *Nicotiana tabacum* cv. Petit Havana is about 18.5 percent total soluble protein.

50. (cancelled).

51. (currently amended) A plastid transformation vector for a stably transforming a plastid genome, said vector comprising, as operably-linked components, a first flanking sequence, a DNA sequence coding for IFNα2b or a polypeptide having at least 95 percent sequence identity therewith, wherein the IFNα2b or the polypeptide having at least 95 percent sequence identity therewith is operably linked to a polyhistidine purification tag and a thrombin cleavage site, and a second flanking sequence, wherein said first and second flanking sequences comprise a sequence inclusive of a transcriptionally active spacer sequence of the plastid genome, whereby stable integration of the DNA sequence into the plastid genome is facilitated through homologous recombination of the first and second flanking sequences with substantially homologous sequences in the plastid genome.

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52. (cancelled).